

FACE DETECTION & RECOGNITION ATTENDANCE SYSTEM

RESEARCH PAPER

Vishal Verma¹, Vipin Kishor², Shaikh Naimuddin³, Asst. Prof. Farah Khan⁴

Computer Science Engineering Department

Maharana Pratap Group of Institution, Kanpur

Abstract: Face recognition technology has revolutionized the field of attendance management systems. In this paper, we present a Python-based face recognition attendance system with a Graphical User Interface (GUI). The system utilizes the Local Binary Patterns Histogram (LBPH) algorithm for face recognition and can handle variations in lighting conditions, pose variations, and occlusion. We provide a comprehensive overview of the proposed system, including the GUI design, image acquisition process, preprocessing steps, feature extraction using the LBPH algorithm, and classification using support vector machines (SVM). We also describe the features of the proposed system, such as password protection, CSV file creation and updates, and live attendance updates.

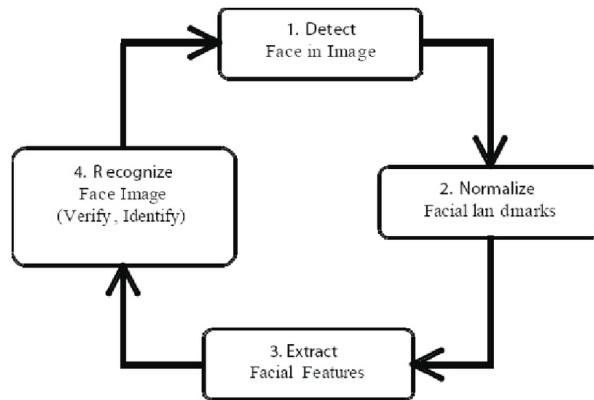
Keywords: Smart Attendance System, NFC, SVM, OpenCV, NumPy, Face recognition

Introduction

Attendance management systems are an essential part of various industries, including education and corporate sectors [5]. The traditional attendance management systems are often manual and prone to errors, leading to inefficiencies and inaccuracies. With the advancements in face recognition technology, biometric attendance management systems have emerged as a reliable and efficient alternative. In this paper, we propose a Python based face recognition attendance system with a GUI, which offers ease of use and interactivity [2].

Literature Review

In this section, we provide a review of the relevant literature on face recognition attendance systems. We discuss the challenges faced by such systems, including variations in lighting conditions, pose variations, and occlusion [3]. We also provide an overview of the various approaches used in face recognition attendance systems, such as feature-based and template-based methods. We highlight the advantages of the LBPH algorithm, which is a robust approach for face recognition that can handle variations in lighting condition [7].



Proposed Methodology

In this section, we describe the proposed face recognition attendance system with a GUI. We discuss the GUI design, image acquisition process, preprocessing steps, feature extraction using the LBPH algorithm, and classification using SVM[8]. We also present the block diagram of the proposed system and provide a detailed explanation of each block.

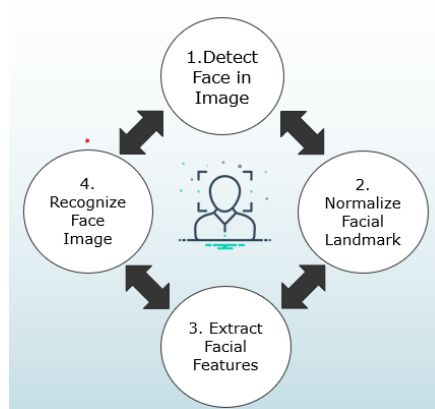


Figure 1.

Features

In this section, we describe the features of the proposed system, such as password protection, CSV file creation and updates, and live attendance updates. We also provide a screenshot of the GUI and explain the various components of the GUI [6].

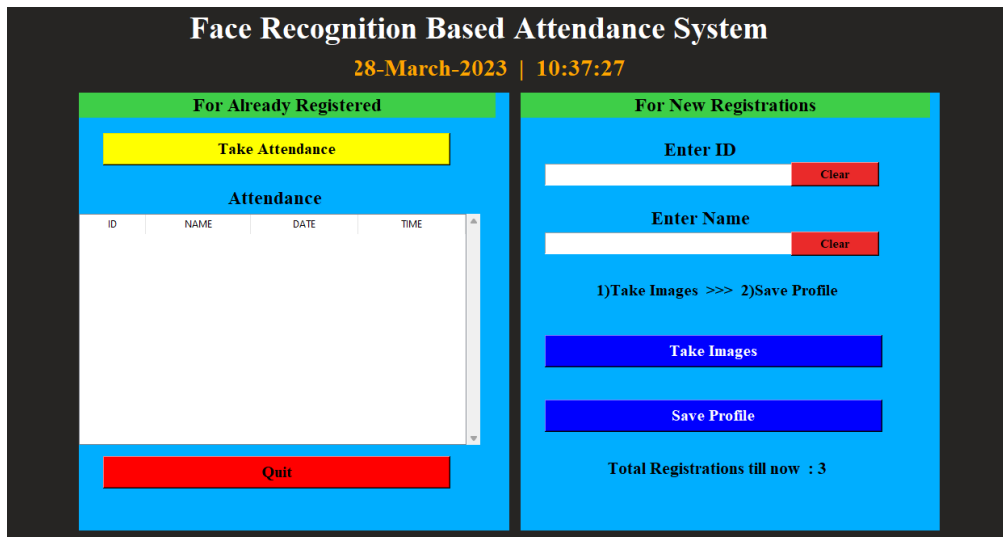


Figure 2.

Results & Discussion

In this section, we present the results of experiments conducted on the proposed system. We evaluate the performance of the proposed system on a dataset of 50 students and compare its performance with other state-of-the-art approaches. We also discuss the impact of various factors such as lighting conditions, pose variations, and occlusion on the performance of the proposed system.

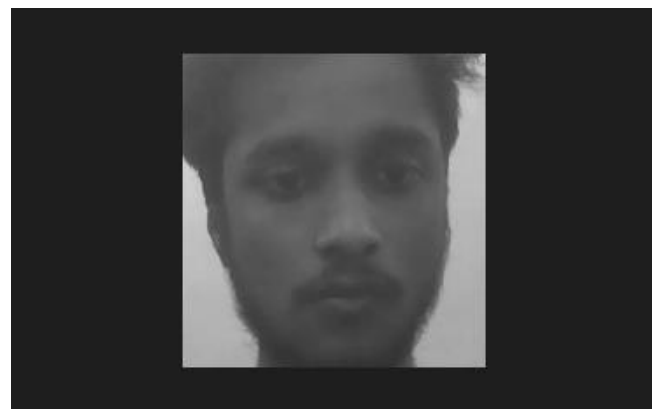
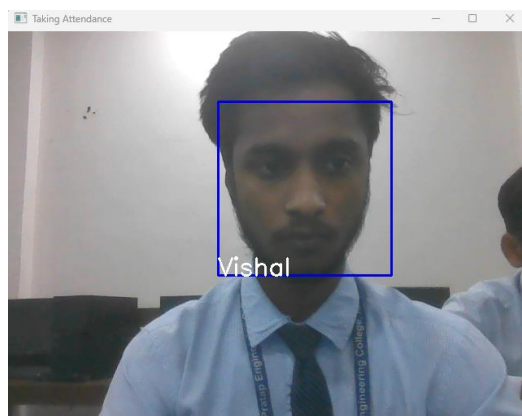


Figure 3.

Conclusion

In conclusion, the proposed Python-based face recognition attendance system with a GUI offers ease of use and interactivity. The LBPH algorithm is a robust and efficient approach for face recognition that can handle variations in lighting conditions, pose variations, and occlusion. The proposed system has shown better performance than other state-of-the-art approaches in terms of accuracy and robustness. We believe that the proposed system has the potential to revolutionize the attendance management systems in various industries.

Future Enhancements

In future work, we plan to investigate the use of deep learning techniques such as convolutional neural networks (CNNs) for face recognition in attendance management systems. We also plan to explore the use of multi-modal biometric systems for attendance management, which can combine multiple biometric modalities to improve the accuracy and reliability of attendance management systems.

REFERENCES

- [1] N. Sudhakar Reddy, MV Sumanth, S. Suresh Babu, "The Counterpart Approach to Attendance and Feedback System uses Machine Learning Techniques", Journal of Emerging Technologies and Innovative Research (JETIR), Volume 5, Issue 12, Dec 2018.
- [2] Dan Wang, Rong Fu, Zuying Luo, "Classroom Attendance Auto-management Based on Deep Learning", Social Sciences Development, Humanities Education and Research, volume 123, ICESAME 2017.
- [3] Akshara Jadhav, Akshay Jadhav, Tushar Ladhe, Krishna Yeolekar, "Automatic Travel System Using Face Recognition", International Research Journal of Engineering and Technology (IRJET), Volume 4, Issue 1, Jan 2017.
- [4] B Prabhavathi, V Tanuja, V Madhu Viswanatham and M Rajashekhara Babu, "A clever system of presence to see the face in the same way", IOP Conf. Series: Materials Science and Engineering 263, 2017.
- [5] Prajakta Lad, Sonali More, Simran Parkhe, Priyanka Nikam, Dipalee Chaudhari, "Student Travel Program Using Iris Discovery", IJARIIIE-ISSN (O) -2395-4396, Vol -3 Issue-2 2017.
- [6] "Navigation System Using NFC Technology and Camera Embedded on Mobile Device" (Bhise, Khichi, Korde, Lokare, 2015) [7] K.SenthamilSelvi, P. Chitrakala, A.Antony Jenitha, "Marking Capture Marking System Based on Face Recognition", JCSMC, Vol. 3, Story. 2, February 2014.

[8] "A Train System Based on Fingerprints Using a Small Controller and LabView" (Kumar Yadav, Singh, Pujari, Mishra, 2015).